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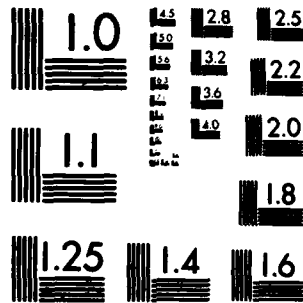
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HANFORD REACH LAND USE COLUMBIA RIVER ENVIRONMENTAL IMPACT WASHINGTON (STATE) BEN FRANKLIN DAM		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
The construction of Ben Franklin Dam at RM 348 would flood lands along the Hanford Reach of the Columbia River to 400 feet mean sea level an upriver to about the Vernita Bridge. The Hanford Reach, the last free-flowing stretch of the Columbia River, would be flooded and converted to a reservoir. Virtually all of the islands, the Taylor flats, Ringold Flats, and portions of the Hanford townsite, Wahluke settlement, and White Bluffs settlement.		


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would be inundated. Flooding of the islands would destroy existing goose/gull nesting and deer fawning habitat. The salmon and steelhead spawning grounds would be eliminated except in the uppermost portions. Numerous archaeological sites would be inundated; the most important of these sites should be excavated before filling of the dam reservoir. Fish and wildlife habitat and public recreation (hunting and fishing) areas would be destroyed. The existing Ringold fish hatchery would be inundated; the facilities would have to be relocated.



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FINAL

**Relationship of the Ben Franklin Dam Alternative
to Water and Land Uses, Plans, Policies, and
Controls for the Hanford Reach of the Columbia River**

Submitted to

Seattle District
U.S. Army Corps of Engineers

Prepared by

Joint Venture
Shapiro and Associates, Inc./Parametrix, Inc./Dan C.

July 1980



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EXECUTIVE SUMMARY

The relationship of the proposed Ben Franklin Dam to federal, state, and local laws, regulations, policies, plans, and ongoing programs and studies is summarized below. The summary is intended to highlight identified conflicts and impacts of the dam on the Hanford Reach.

Existing Land Use

The construction of Ben Franklin Dam at RM 348 would flood lands along the Hanford Reach of the Columbia River to 400 feet mean sea level and upriver to about the Vernita Bridge. The Hanford Reach, the last free-flowing stretch of the Columbia River, would be flooded and converted to a reservoir. Virtually all of the islands, the Taylor Flats, Ringold Flats, and portions of the Hanford townsite, Wahluke settlement, and White Bluffs settlement would be inundated. Flooding of the islands would destroy existing goose/gull nesting and deer fawning habitat. The salmon and steelhead spawning grounds would be eliminated except in the uppermost portions. Numerous archaeological sites would be inundated; the most important of these sites should be excavated before filling of the dam reservoir. Fish and wildlife habitat and public recreation (hunting and fishing) areas would be destroyed. The existing Ringold fish hatchery would be inundated; the facilities would have to be relocated.

Land Use Plans

Land use plans of federal, state, and local agencies would be affected by the proposed dam as follows:

U.S. Department of Energy

- . Potential soil liquefaction problems restricting plant siting opportunities along the right bank of the river may be increased due to groundwater level changes.
- . Relocation and redesign of water intake systems for the nuclear reactors would be required.

U.S. Bureau of Land Management (BLM)

- . Islands managed by BLM would be inundated.

U.S. Fish and Wildlife Service

- . The islands of the McNary National Wildlife Refuge would be inundated.
- . Parts of the Saddle Mountain National Wildlife Refuge would be flooded.

Washington State Department of Game

- . Portions of the Wahluke Wildlife Recreation Area, including the

Ringold Units, would be inundated.

- . The Ringold hatchery (also operated by Washington State Department of Fisheries) would have to be relocated.

Franklin County

- . Lands designated Developmental Restraints would be inundated.
- . Shorelines designated Conservancy (for preservation of natural and cultural resources) would be flooded.

Laws, Regulations, and Policies

There are many federal laws on water resources, fish and wildlife, cultural (archaeological/historical) resources, and power production with which the proposed Ben Franklin Dam would have to comply. Close coordination between the Corps of Engineers and other federal agencies and state agencies, in particular the Washington State Departments of Fisheries and Game, would be necessary in planning the dam so that agency concerns could be fully addressed and measures to mitigate adverse impacts identified. Because there is very little local jurisdiction in the area affected by the dam (only Franklin County), local laws and policies would be minimally affected. The following specific points should be noted:

- . The U.S. Fish and Wildlife Service (FWS) has adopted an official position opposing the dam and has stated that the dam's impacts cannot be mitigated.
- . Inundation of the McNary National Wildlife Refuge lands could constitute a violation of Section 3(d) of the Fish and Wildlife Coordination Act, since these lands were mitigation for wildlife losses associated with McNary Dam.
- . The Hanford Reach has been designated a potential national wild, scenic, or recreation river under Section 5(d) of the Wild and Scenic Rivers Act. It has also been included on the Nationwide Rivers Inventory List of the Heritage Conservation and Recreation Service (HCRS) and has been preliminarily proposed for study authorization classification under Section 5(a) of the Act. Because of these designations, the Corps would have specific requirements to meet under the Wild and Scenic Rivers Act.
- . The FWS has identified endangered or threatened plant and animal species in the area which would be affected by the dam (as listed under the Endangered Species Act).
- . The BLM has evaluated the islands they manage for possible wilderness designation and has recommended that the islands not be designated for wilderness.
- . Coordination by the Corps with the HCRS, the Advisory Council on Historic Preservation, and the Washington State Office of Archaeology and Historic Preservation will be particularly important in planning

Ben Franklin Dam because of the extensive known and potential historic and prehistoric cultural resources along the Hanford Reach.

- . The Ben Franklin Dam could affect minimum flow requirements for Priest Rapids Dam.
- . The Columbia River is a River/Shoreline of Statewide Significance under the Washington State Shorelines Management Act.
- . Planning for the Ben Franklin Dam would need to consider the Instream Resource Protection Program administered by the Washington State Department of Ecology.

Programs, Studies, Projects

Ongoing programs, studies, and projects of federal, state, and local agencies would be affected by the Ben Franklin Dam. In particular, the following points should be noted.

- . The Washington Natural Heritage program has identified several important species in the Hanford Reach that would be affected by the Ben Franklin Dam alternative.
- . Portions of the Saddle Mountain and McNary National Wildlife Refuges and of the Wahluke Wildlife Recreation Area (in particular the Ringold Unit) would be inundated. Ongoing programs in these areas would be affected.
- . The Hanford Reach is in the Hanford National Environmental Research Park, in which ongoing research studies are being conducted. Any such studies dependent on the river and its banks in their present state could be adversely affected by the dam.
- . The Hanford sand dunes on the right bank of the river have been nominated for National Natural Landmark status.
- . Nuclear waste disposal programs in the 100 area (Figure 2) and groundwater effluent in the 200 waste disposal area could be affected by the dam.
- . Ongoing studies of spawning at Vernita Bar and juvenile downstream migration would be completed prior to construction of the Ben Franklin Dam. The results or possible recommendations of these studies could be affected by the dam.

A. INTRODUCTION

The Seattle District, U.S. Army Corps of Engineers, is conducting a study of the alternative uses of the Hanford Reach of the Columbia River under the authority of a congressional resolution adopted 28 May 1959. One of the alternative uses involves the construction of the Ben Franklin Lock, Dam, and Reservoir for hydroelectric power generation and navigation.

This study examines the relationship of the Ben Franklin Lock and Dam Alternative to the water and related land uses, plans, policies, and controls for the Hanford Reach. The study area includes the Columbia River and its banks from Priest Rapids Dam to North Richland (Figure 1). The Ben Franklin Dam site is located at River Mile (RM) 348.

The Ben Franklin Dam, as proposed in 1969, would have a height of 82 feet above the streambed. Normal full pool elevation would be at 400 feet above mean sea level with a minimum pool elevation of 390 feet. The spillway would be designed to pass 1,600,000 cubic feet per second through 15 gates, each 69 feet wide by 72 feet in height. The powerhouse would have 16 generator units with a nameplate rating of 53,000 kilowatts each. Average annual output was estimated at 3.75 billion kilowatt hours. A navigation lock with a width of 86 feet, length of 675 feet, 15 feet of depth over the sill, and a maximum lift of 59 feet was incorporated in the design. Two earthfill sections would be required: 7,100 feet in length to the west of the powerhouse and 600 feet to the east of the navigation lock. The reservoir formed by this dam would be approximately 49 miles in length, 25,000 acres in area, and have 120 miles of shoreline at normal full pool elevation of 400 feet above mean sea level.

Information for this study was obtained from many sources. A questionnaire was sent to 124 agencies and interest groups, requesting information on jurisdictional boundaries, land use plans, regulations, policies, programs and studies, and perceived relationships between the dam and land and water uses in the Hanford Reach. A total of 28 agencies or groups responded to the questionnaire. Many of the respondents sent documents for review and consideration in the study. In addition to the questionnaire, 25 agency representatives were interviewed by telephone or in person. A list of all agencies and groups contacted during the preparation of this report is in Appendix A. Two field trips to the study area, including one aerial reconnaissance, were made. An extensive literature review was conducted; it included reports and documents assembled by the Corps, as well as those identified by other agencies and groups in interviews and/or questionnaires. The Bibliography to this report includes only those documents that are pertinent to this study. Large scale aerial photographs in both black and white and color were used as the basis for land use mapping in the study area.

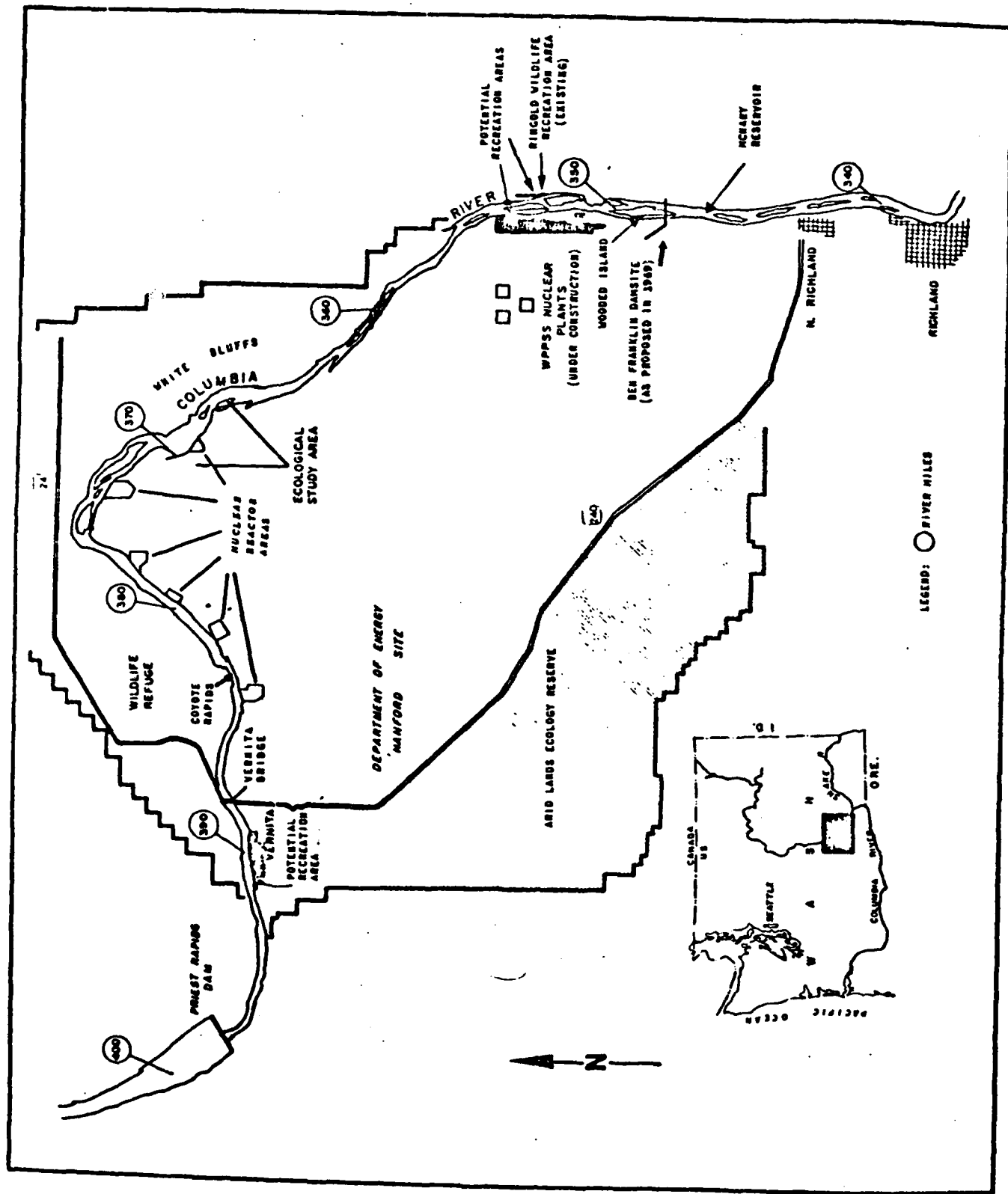


FIGURE 1

HANFORD REACH STUDY AREA

II. EXISTING LAND USE

Land use in the study area was mapped at a scale of one inch equals approximately 2,000 feet from black and white aerial photographs, supplemented by natural color aerial photographs, the Reach Inventory maps of the Corps of Engineers, other land use maps, and an aerial reconnaissance. The land use classification system used for mapping is shown in Table I; it was developed to reflect the typical land uses in the Hanford Reach study area. Other more specialized land uses, such as wildlife refuge areas or historical sites, are labeled directly on the land use maps and so are not listed in Table I.

Land uses of the Hanford Reach of the Columbia River are typified by open space, irrigated agriculture, park and wildlife refuges, historical/archaeological sites, and nuclear reactor sites. The Hanford Reach of the Columbia River is 52 miles long and is located between the headwaters of Lake Wallula at River Mile (RM) 345 and the Priest Rapids Dam at RM 397; it is the only unimpounded portion of the Columbia River above Bonneville Dam in the United States. The river is in the Columbia Basin, which is semi-arid desert dominated by low shrubs (sagebrush, rabbitbrush, and bitterbrush) and grasslands.

Most of the reach is within the Hanford Reservation (RM 343.5-392) under the control of the U.S. Department of Energy (DOE). Public access to the right bank from RM 343.5 to 392 and to the left bank from RM 356 to 392 is restricted.

There are no urban-type land uses on the reach other than the Battelle Research Complex and Exxon Nuclear, both located just north of Richland and just south of the Hanford site, six DOE nuclear areas, the Washington Public Power Supply System (WPPSS) construction site, and some urban (extractive) areas (borrow pits). The six DOE nuclear areas are located on the riverfront on the right bank. WPPSS currently has three steam-electric (nuclear) plants under construction on the Hanford Reservation. Hanford No. 1 and No. 4 are located at approximately RM 351.86 and Hanford No. 2 at approximately RM 351.75. The water intake for the WPPSS site is at RM 353 on the right bank. North of the WPPSS site on the right bank there is a sizeable area of sand dunes, from approximately RM 353 to RM 358; these dunes are a unique ecological feature. North of the dunes at approximately RM 361 is the Old Hanford Townsite, evacuated in 1942 when the area was purchased by the United States Government for the Hanford Nuclear Reservation. Also north and west on the right bank of the river are three inactive nuclear reactor sites (100-F, 100-H, and 100-D) located at approximately RM 368.5, RM 372.5, and RM 377.5, respectively. Upstream from these at approximately RM 380 is the only active reactor site (100-N) on this reach; this is the "N" reactor. Further upstream of the "N" reactor, the final two inactive nuclear reactor sites (100-K and 100-B) are located at approximately RM 382 and RM 384. Upstream from the last inactive nuclear reactor site at about RM 385 are some old borrow pits, now ponds.

At the five inactive sites, there are eight nuclear reactors. The B- and C-Reactors at 100-B area are currently in standby status, as are the KW- and KE-Reactors at 100-K area. The J- and DR-Reactors (100-D area), the

Table 1

LAND USE CLASSIFICATION SYSTEM

Ag, Agriculture (Irrigated)

Areas in which irrigated agricultural activities are currently being conducted; typically dark or green colors and irrigation patterns.

Ag_a, Agriculture (Abandoned)

Areas used for agriculture in the past, as indicated by furrow patterns and/or regular field patterns.

OS, Open Space

General open space areas in which no particular human land uses occur; much of the study area is open space.

OS_d, Open Space (Dunes)

Sand dune areas; an example is the large dune area on the right bank of the river from RM 353 to RM 358.

OS_s, Open Space (Scrub)

Open areas vegetated with scrub brush and low shrubs.

OS_w, Open Space (Wetland)

Wetlands, as defined by the U.S. Army Corps of Engineers.

U_e, Urban (Extractive)

Gravel or sand mining; borrow pits.

U_n, Urban (Nuclear)

Active and inactive nuclear reactor sites and associated nuclear research facilities, such as the Exxon fast flux facility.

H-Reactor (100-H area), and the F-Reactor (100-F area) are all in retired status (Ballelle, The Effects of the Ben Franklin Dam on the Hanford Site, 1979, p. 104). The five inactive sites also contain facilities and equipment associated with the nuclear reactors, such as retention basins, reactor effluent piping, waste burial grounds, liquid waste disposal trenches, laboratories and other buildings. The facilities at each site are cataloged in the Battelle 1973 report cited above, pp. 103-173.

Continuing along the right bank of the river, the old Vernita ferry slip is just upstream from the borrow pits at about RM 388. From this point upstream to the Priest Rapids Dam the right bank shoreline becomes very rocky and at approximately RM 392 slopes steeply upward to the Umtanum Ridge. This is the only ridge which occurs on the right bank of the river from the Priest Rapids Dam to Richland. The remaining shoreline on the right bank slopes gently upward from the river all the way to North Richland. Located on the flat land just south of the ridge is Midway Substation. The Bonneville Power Administration has overhead power lines crossing the river here (RM 390-391) and at three other places on the Hanford Reach (RM 380, 369.4, and 351). Pacific Power and Light and Grant County Public Utility District (PUD) each have one overhead crossing along this reach of the river (RM 362.3 and RM 380 respectively). The Yakima Firing Center Military Reservation is located in the lower slopes of the ridge just upstream from the substation.

The upstream end of the study area is the Priest Rapids Dam located at approximately RM 397. Downstream of the dam on the left bank is a spawning channel, which connects to the Columbia further downstream. Wetlands occur in various places along this channel.

Much of the upland on the left bank of the river extending downstream from Priest Rapids Dam to Vernita Bridge is irrigated agriculture. This area of agriculture is not located on the river bank but is approximately three miles inland from the river.

Steep, nearly vertical slopes occur in two places on the left bank of the river between the Priest Rapids Dam and North Richland. The first cliffs occur downstream from the Umtanum Ridge by Vernita Bridge. The other cliffs occur downstream near RM 365 toward North Richland and are called the White Bluffs.

The 32,000 acre Saddle Mountain Wildlife Refuge is located on the left bank of the river below Priest Rapids Dam. The refuge lies within Department of Energy (DOE) boundaries and is managed by the U.S. Fish and Wildlife Service for migratory birds and resident wildlife. Wildlife habitat in this refuge is managed to improve and increase waterfowl and resident game production. The Saddle Mountain Refuge is entirely closed to entry.

The 54,000 acre Wahluke Wildlife Recreation Area (WRA) is located downstream from Saddle Mountain Refuge on the same side of the river. The area is managed by the Washington State Department of Game for wildlife and recreation purposes. It is open to the public for hunting and fishing with seasonal and locational limitations and for hiking and wildlife observation. The flats between the river and the bluffs on the left bank, including Savage Island and a portion of the bluff slope, are known as the Ringold

Unit of the Wahluke WRA. This unit is managed for improvement of waterfowl feeding and resting habitat by the Game Department. At Ringold Springs, the Washington Departments of Fisheries and Game operate rearing facilities for fall chinook and coho salmon and steelhead trout.

Several islands in the lower portions of the reach are managed as part of the McNary National Wildlife Refuge, the major portion of which is located downstream outside the Ben Franklin study area. The islands are important as waterfowl production areas and are managed to improve waterfowl and wildlife habitat.

South of the Wahluke Recreation Area is more irrigated agricultural land, starting at approximately RM 360, and extending south to Richland. This agricultural land is part of the U.S. Bureau of Reclamation's Columbia Basin Irrigation Project, the purpose of which is to provide irrigation water for reclaiming lands for agricultural uses.

There are many islands within the Hanford Reach of the river; the largest are Wooded Island and Locke Island. All the islands are undeveloped and in their natural state (however, the Game Department proposes selected plantings on Savage Island). The islands provide habitat for many wildlife species such as gulls, geese, and deer, as well as providing spawning gravel for fish. These islands are particularly important for gull and goose nesting and deer fawning because of their isolation.

The Hanford Reach is a major location of cultural resources in the middle Columbia Basin. As mentioned in the Corps of Engineers Columbia River Reach Inventory, a survey of the reach made by Washington State University in 1968 located 105 archaeological sites, many of which are located on the low river banks and islands. In 1977 a cultural resource survey for a proposed Bonneville Power Administration transmission line resulted in the discovery of 19 new archaeological sites adjacent to the Columbia River not far from Ringold Flats. There are six known sites related to the Wanapum Indians in the Wooded Island District alone. The State Office of Archaeology and Historic Preservation lists 129 known archaeological sites in the study area for the Ben Franklin Dam. The Wahluke settlement area is at about RM 377, and the White Bluffs settlement area is about RM 369. The Hanford Townsite is at about RM 362. Nine cultural resource sites have been nominated for the National Register of Historic Places. The Ringold formation contains extensive fossil beds between RM 364 and 376, and a tertiary fossil site about RM 355.

The entire Department of Energy Hanford site (with the exception of certain operating areas) has been designated the Hanford National Environmental Research Park (NERP). The purpose of the Hanford NERP is to allow research studies in a nearly pristine steppe environment; it offers unique opportunities to study the interaction between nuclear energy development facilities and the surrounding environment. The Hanford NERP welcomes scientists from state and federal agencies, universities, and private organizations who wish to design and conduct research studies to help answer questions about man's impact on the environment. Studies in progress in the Hanford NERP deal with land restoration and associated plant and animal characterizations. Studies involving the Hanford Reach and the river banks include tracking of hawk and mule deer migratory patterns and monitoring of

Columbia River sturgeon. The Arid Lands Ecology (ALE) Reserve occupies 120 square miles of the Hanford NERP from State Road 243 to the southwest boundary of the Saddle Snake Ridge. The Reserve is not on or near the Columbia River.

Public recreation is a significant use of the Hanford Reach. In the Wahluke WRA, hunting for ducks, geese, and deer occurs in the fall, with the Columbia River and its banks one-quarter mile from the river closed to waterfowl hunting from the Hanford Power Line (Pacific Power and Light, RM 362) upstream to Vernita Bridge. Fishing for salmon and steelhead is popular along the reach. Public pleasure boating and waterskiing occurs in the lower portions of the reach. Wildlife observation and study, hiking, and artifact hunting also occur along the river banks.

The Ben Franklin Lock and Dam would change the land and water uses of the Hanford Reach. With a normal full pool elevation of 400 feet, any lands below the existing 400-foot contour line (see the Land Use Maps) would be inundated; this includes about 11,000 acres of land (total reservoir acreage would be approximately 25,000 acres). Only the portion of the river above Vernita Bridge would remain in approximately its natural state.

Wooded Island, Savage Island, Locke Island, and all the other islands would be covered with water, except for a small portion of the Gull Island just upstream of Coyote Rapids. Destruction of these islands would eliminate the wildlife habitat they afford; in particular, gull and goose nesting and deer fawning would be adversely affected. The river banks and many of the islands contain archaeological sites which would be destroyed. A portion of the shifting sand dunes on the right bank around RM 355 would be inundated, as would parts of the Hanford, White Bluffs, and Wahluke settlement sites. In the Ringold Flats area, the fish hatchery would have to be relocated and managed wildlife habitat would be eliminated. The islands in the McNary National Wildlife Refuge would be flooded. The salmon and steelhead recreational fisheries (and spawning grounds) would be destroyed. Pleasure boating, swimming, and waterskiing opportunities might be increased. Popular waterfowl and pheasant hunting sites would be inundated. Although no prime or unique farmlands have been identified within the 400 foot elevation in Franklin County, such farmlands above the 400 foot elevation might experience secondary impacts if bank sloughing occurs on bluffs wetted by pool waters.

The NERP studies which are associated with the river and its immediate banks would be disrupted. The ALE Reserve would not be affected.

The Ben Franklin Dam would affect approximately 65 radioactively contaminated facilities on the Hanford site. The effects are described in detail in the Battelle 1979 report cited above, pp. 103-173. The 100-F area, which is the farthest downstream and at the lowest elevation of the six reactor areas, would be the most severely affected. Many of the 100-F facilities would be partly or wholly inundated by reservoir waters, including reactor effluent piping, a retention basin, the river outfall structure, liquid waste disposal sites and burial grounds. Several similar facilities at the 100-H area would also be inundated, but not to the extent that the 100-F area would be affected. The 100-D area would not be submerged, but portions of the 100-D/DR Reactors effluent system might be affected by

elevated groundwater tables. Effects on the 100-N area are not known, but the facilities are largely situated about 40-50 feet above reservoir elevations at flood stage (400-410 feet mean sea level). Portions of the reactor effluent systems at 100-K and 100-B areas would be affected.

C. RELATIONSHIP TO LAND USE PLANS

Those agencies which have jurisdiction in and identified land use plans for the Ben Franklin Dam study area include the U.S. Department of Energy, the U.S. Bureau of Land Management, the U.S. Fish and Wildlife Service, the Washington State Department of Game, and Franklin County. The land use plans of these agencies and their relationship to the Ben Franklin Dam are discussed below. Many other federal and State agencies have interest or jurisdiction along the Hanford Reach, but no land use plans; the laws/regulations and policies under which these agencies operate are discussed in Section D.

U.S. Department of Energy (DOE). The closest document to a land use plan for DOE is the conceptual layout of a Hanford Nuclear Energy Center (Figure 2). The Hanford site land uses shown in Figure 2 are the conceptual plan for the location of 20 nuclear reactors and associated facilities on the Hanford Reservation. The plan also shows ecological study areas (including islands), dune study areas, an isotopic uptake area, a hot water irrigation site, and vegetative recovery areas. The study report on the Hanford Nuclear Energy Center notes that the purpose of this site plan is to provide a common basis for various technical studies and that it should not be considered an optimum arrangement of facilities or a selection of specific sites.

Three areas of potential conflict between the Ben Franklin Dam and existing/future operations have been identified recently by the Department of Energy. These are as follows:

- a) Would the Ben Franklin pool create a soil liquefaction problem below potential reactor sites in a Hanford Nuclear Center?
- b) Would the dam otherwise complicate the siting of commercial reactor sites at Hanford?
- c) Would the dam introduce hydraulic or seismic problems relevant to underground waste repository siting?

An analysis for DOE by C.H. Henager of Pacific Northwest Laboratories, Battelle (Enclosure No. 1 in a letter to Colonel Leon Moraski from A. Fremling, Department of Energy, Richland, dated 27 May 1980), concluded the Ben Franklin pool at 400 feet mean sea level would not cause a soil liquefaction problem at 300 Area (downstream of the dam site), at 200-E or 200-W Areas, at 400 Area (FFTF) or at any other area on the Hanford site where the elevation (ground surface) is 60 feet or more above the potential high water table. A soil survey indicates no liquefaction problems at 100-N Area. There would probably not be soil liquefaction problems at 100-B, 100-K, and 100-D Areas (soil surveys would be required to show this). Such problems might occur at 100-H and 100-F Areas. See Figure 2 for location of these areas.

Soil liquefaction problems exist at the WPPSS No. 1, 2, and 4 sites (Figure 2). A site-by-site assessment for soil liquefaction problems would be necessary in an area within about one-to-three miles of the right bank of

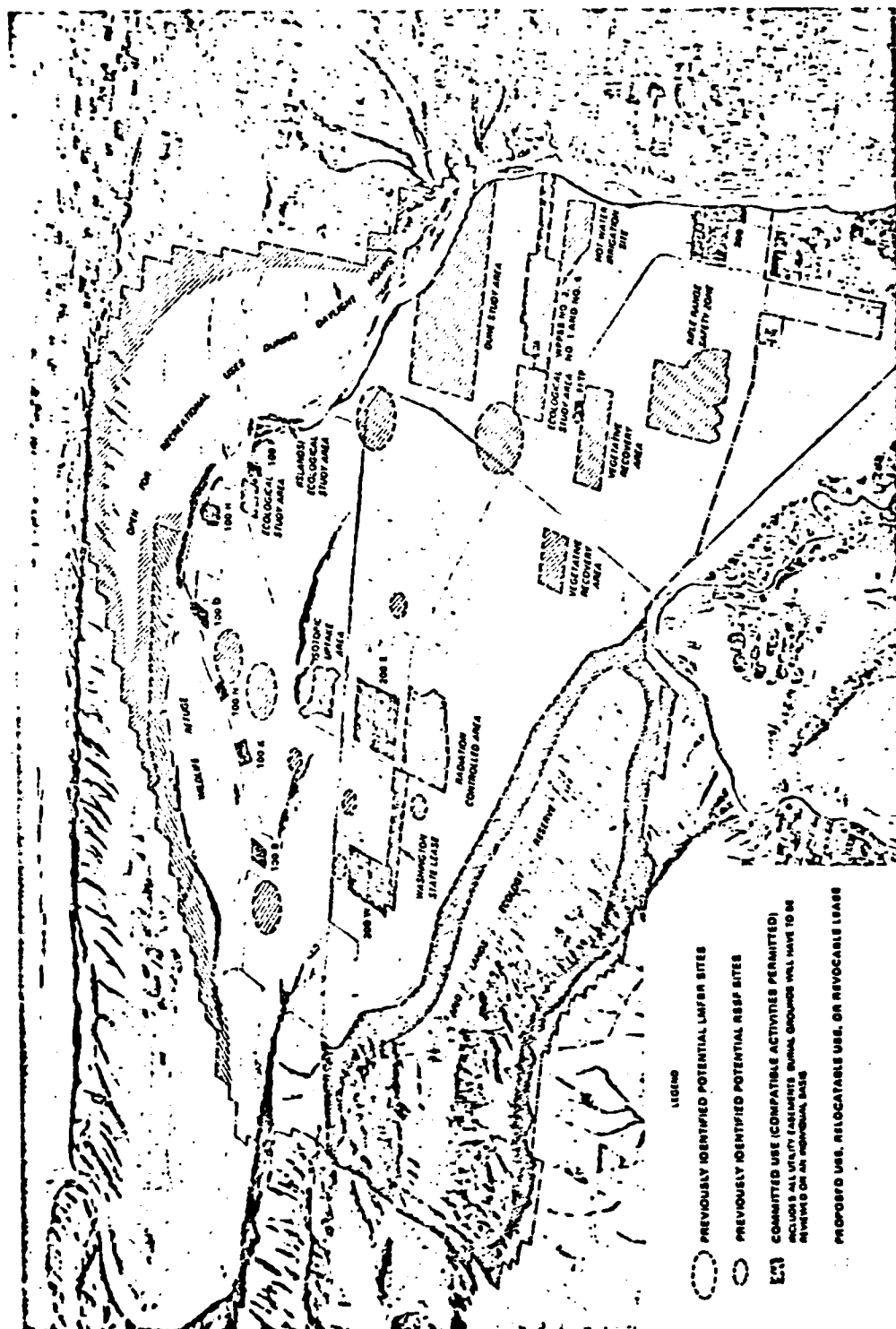


Figure 2

HANFORD SITE LAND USES, U.S. Department of Energy

Source: The Hanford Nuclear Energy Center,
A Conceptual Study, Battelle Memorial
Institute, September 1978, p. 27.

the river between 100-F and the WPPSS site (the probable area for siting commercial reactor facilities).

The Ben Franklin Dam would complicate, but not preclude, the siting of commercial reactors at Hanford. Potential problems as described in the Henager analysis include:

- . Reduced heat sink capacity of the Columbia River, limiting the feasibility of once-through cooling.
- . Reduced amount of available land and possible road relocations.
- . Increased length of river crossings (e.g., transmission lines, bridges).
- . Increased complications in water plant intake construction for reactors and relocation of existing facilities.
- . Increased water pump intake siltation problems and effects on water pumping from pool fluctuations.
- . Depending on location, additional waterpooling for subsurface basalt waste isolation projects below 440 feet mean sea level.
- . Increased public access with attendant problems.
- . Aggravated landslide problems at White Bluff and possible effects on earthquake intensity.

According to an analysis by R.A. Deju (Enclosure No. 2 in a letter to Colonel Leon Moraski from A. Fremling, Department of Energy, Richland, dated 27 May 1980), the dam will not affect the feasibility of subsurface waste storage. The storage areas are effectively isolated from uppermost ground-water flow systems.

U.S. Bureau of Land Management (BLM). The BLM administers several islands or portions of islands in the Hanford Reach; these are located between the proposed Ben Franklin dam site at River Mile (RM) 348 and RM 384. They include part of Wooded Island, all or portions of the unnamed islands between Wooded Island and Savage Island, islands around RM 365 and RM 375, and Gull Islands above Coyote Rapids (RM 384). Surface and mineral estates of the islands are under BLM administration. The BLM is currently developing land use plans for these islands; the plans are not yet available. Virtually all of the islands except Gull Island would be flooded by Ben Franklin Dam. According to a representative of BLM, the resources which seem most likely to be affected by the dam are wildlife habitat and recreation use.

U.S. Fish and Wildlife Service (FWS). The agency manages two refuges in the Ben Franklin study area, as mentioned in Section B, Existing Land Use; these are the Saddle Mountain National Wildlife Refuge (NWR) and a portion of the McNary NWR. The primary objective of the Saddle Mountain NWR is to provide habitat and protection for waterfowl, other migratory birds, threatened species and other native wildlife. Development and management of

aquatic habitats, preservation of the natural condition of the refuge (including river shoreline and sand dunes), and protection of cultural resource sites are some of the specific measures planned by the FWS. The area presently is semi-arid desert with some ponds and a lake supplied by irrigation wastewater. Irrigation wastewater from the Bureau of Reclamation's Columbia Basin Project to irrigate 19,000 acres of the Wahluke slope will be used by the FWS to create 11 separate new water bodies, which will provide 2,348 acres of new marsh and water habitat on the refuge. None of these water bodies would be affected by Ben Franklin Dam. The shoreline of the Saddle Mountain NWR is mostly fairly steep and high bank, so the water level elevation resulting from the dam would not flood much refuge land.

The islands of the McNary NWR, which are managed for waterfowl and wildlife habitat, would all be flooded by the Ben Franklin Dam.

Washington State Department of Game (WDG). The agency manages the Wahluke Wildlife Recreation Area (WRA) under agreement with the U.S. Department of Energy. It also manages a small area on the river at Ringold under agreement with the U.S. Water and Power Resources Service; the fish hatchery (steelhead rearing) pond is at this location. The WDG has land use/vegetation planting plans for wildlife habitat development and improvement for the Ringold Units No. 1 and 2 of the Wahluke WRA, including the left bank of the river around Savage Island and parts of Savage Island itself. WDG also plans for cooperative farm units and agricultural use in Ringold Unit No. 4 around the Hanford power line (RM 362). Most of Ringold Unit No. 4 and portions of Nos. 1 and 2 are below the 400 foot normal full pool elevation and would be flooded by the dam. The Ringold fish hatchery facilities would have to be relocated.

Franklin County Planning Department. This agency has jurisdiction over the left bank of the Columbia River south of the Hanford Reservation (south of about RM 356). Both the Comprehensive Plan and the Shorelines Master Program apply; they are summarized below.

Franklin County Comprehensive Plan, 1979. This Plan is intended to guide development in the County based on population projections and County goals. The Plan has residential, agricultural, recreational, commercial, industrial, developmental restraints and light industrial commercial designations. The area adjacent to the Ben Franklin Dam site in Franklin County, on the left bank of the river from Sagemoor Road to the Hanford Reservation, is designated as having Developmental Restraints. An area may be designated as Developmental Restraints because of limitations such as landslide areas, high water table, aquifer recharge, unstable soils, fault zones or unstable geology, floodplains, or areas in the Shoreline Management Master Program of Franklin County. In this case, the soil type is the Hezel-Wielhl-Ottman Association (well and excessively drained soils underlain by calcareous laminated lake deposits) and the downstream portion of the area is subject to erosion, slumps, and slide potential. The area between RM 348 and about RM 350 is Taylor Flats (floodplain). As development is proposed in this area, site-specific information would have to be obtained to examine the extent of the developmental potential or limitations. The area bordering the river south of Sagemoor Road to Pasco is designated Agriculture.

The proposed Ben Franklin Dam site is upstream of the Agriculture area, which would therefore experience little or no changes. In the Developmental Restraint area, the area below RM 348 would be little affected. Much of the Taylor Flats area will be flooded as it is below the 400 foot contour.

Shorelines, Franklin County, 1975. Although it has no legal jurisdiction within the Department of Energy Hanford Site, the County has classified the shoreline along the Hanford Reach as Conservancy. South of the Reservation line, the County territory along the river is classified as either Conservancy or Rural. The purpose of the Conservancy classification is to maintain an area's natural character and to "protect, conserve and manage existing natural resources and valuable historic and cultural areas" for recreational benefits and sustained resource use. Preferred uses are those which are nonconsumptive (activities which use resources on a sustained basis without precluding the future use of these resources) of the area's physical and biological character. The Rural environment is intended to protect agricultural land, restrict intensive use of undeveloped shoreline, and maintain open space and recreational opportunities. This classification is for areas characterized by intensive agricultural and recreational uses or having a high capability for these activities. Flooding of Conservancy areas above RM 348 would inundate existing natural resources and pre-historic historic cultural resource sites on the islands and low areas of the river bank. Commonly used public recreation (hunting, fishing) areas would be inundated; however, the dam pool would potentially increase boating opportunities.

D. RELATIONSHIP TO LAWS, REGULATIONS,
AND POLICIES

This section of the study represents a summary of Federal and State laws, regulations, and policies which would influence land use and/or development within the study area. Only one local agency (Franklin County) has any jurisdiction in the Ben Franklin study area; its most important policies are discussed in Section C. This section is in two parts: (1) Federal, and (2) State.

1. FEDERAL LAWS, REGULATIONS AND POLICIES

GENERAL

Law: National Environmental Policy Act of 1969 (NEPA) (PL 91-190). Declares a national policy which encourages productive and enjoyable harmony between man and his environment and promotes an effort which will prevent or minimize damage to the environment and biosphere. This law established the Council on Environmental Quality (CEQ) to oversee the administration of the Act. The Act requires an Environmental Impact Statement (EIS) for any major federal action significantly affecting the quality of the human environment. The Corps would prepare an EIS for the proposed Ben Franklin Dam.

WATER RESOURCES

Law: Clean Water Act of 1977 (PL 95-12). The goal of this law is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. It is a national goal that the discharge of pollutants to the nation's waters be eliminated by 1985. It is an interim goal that all navigable waters be suitable for propagation of fish and shellfish and for water-contact recreation by July 1, 1983. The Act sets up a comprehensive program for water pollution control and includes provisions for excessive river basin planning. The Washington State Department of Ecology (WDE) implements portions of this Act with the Environmental Protection Agency (EPA). Section 404 of this Act established a permit procedure for disposal of dredged or fill material in waters of the U.S. and adjacent wetlands; EPA and the Corps of Engineers (COE) administer the permit procedures and the actual permit is granted by the COE (404 Permit). Consultation is required with federal, state, and local agencies and the public prior to a determination of disposition of permit issuance. A 404 evaluation would have to be done for any proposed fill or discharge of dredged material associated with the Ben Franklin Dam project.

The procedures outlined in the Act are oriented toward regulating point-sources of water pollution. The Act does present general criteria for incorporating water quality control strategies in plans for impounding water and makes the EPA Administrator responsible for determining the value of dams for this purpose. In addition, the Administrator is responsible for defining guidelines and processes, procedures, and methods for controlling pollution from "changes in the movement, flow, or circulation of any navigable

waters or ground waters, including changes caused by the construction of dams, etc."

Under the Clean Water Act, planning for Ben Franklin Dam would have to consider water quality control procedures during construction and operation. If any discharge of dredged or fill material in wetlands were associated with the dam construction, the Section 404 requirements (and Corps regulations 33 CFR 320-329) would have to be considered.

Law: Water Resources Planning Act of 1965 (PL 89-80). This Act created the Water Resources Council (WRC). The WRC was given the authority to recommend principles, standards, and procedures for river basin plans, and formulation and evaluation of projects. The Principles and Standards for Planning Water and Related Land Resources were established pursuant to Section 103 of this Act; they became effective on 25 October 1973. Revisions were made in December 1979 and proposed rules for new revisions were established in April 1980.

The Principles and Standards outline the conceptual basis for planning of water resource projects and the methods for selecting objectives, measuring beneficial and adverse effects, and comparing alternatives. When a federal agency initiates an investigation or a water resource planning study, it shall follow these principles and standards with appropriate coordination and consideration of problems of mutual concern with other federal agencies and with interested regional, state, and local public agencies and private interests. The Corps of Engineers, as a federal agency, would have to comply with these principles and standards in planning for the Ben Franklin Dam.

NATURAL RESOURCES/FISH AND WILDLIFE

Law: Fish and Wildlife Coordination Act (16 USC Sec. 661 et seq.). This Act, as amended, states the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and be coordinated with other features of water resources development programs. Adverse effects on fish and wildlife resources and opportunities for improvement of fish and wildlife shall be examined along with other purposes which might be served by water resource developments. Section 2(a) defines the area of interest to include impoundment, diversion, channel deepening, or modification of a stream or other body of water. All pre-authorization and post-authorization planning on project development, without exception, shall be coordinated with the Fish and Wildlife Service (FWS), the National Marine Fisheries Service, and the agencies administering the fish and wildlife resources of the State wherein construction is contemplated. Early and continuing coordination is essential to fulfill the spirit and intent of law and administrative policy. For the Ben Franklin Dam, the State agencies responsible under this act are the Washington State Departments of Fisheries and Game.

Under the Fish and Wildlife Coordination Act, the FWS prepares an independent evaluation of the impact of a water resources project on fish and wildlife and makes recommendation for minimizing adverse impacts and for mitigation if necessary. Such an evaluation has been prepared for the pro-

posed Ben Franklin Dam. The FWS has taken an official position opposing the Ben Franklin Dam and has determined that the dam's impacts could not be mitigated.

Inundation of the McNary Wildlife Refuge lands, and downstream effects created by the proposed Ben Franklin Dam, could constitute a violation of Section 3(d) of the Fish and Wildlife Coordination Act, since these lands were turned over to the FWS as mitigation for wildlife losses associated with the McNary Dam project downstream. Resolution of this issue would need to be made by the Corps of Engineers and the FWS during project planning.

Law: Wild and Scenic Rivers Act (PL 90-542). This Act is administered by the Heritage Conservation and Recreation Service (HCRC). The Hanford Reach of the Columbia River was designated as a potential wild, scenic, or recreational river under Section 5(d) by publication in the Federal Register on October 28, 1970. Section 5(d) of the Act, as amended, states: "In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potentials. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources involved." Because of this designation in the water resources development study of the Hanford Reach, the Corps of Engineers would have to do an analysis of the free-flowing characteristics and values of the river and give equal consideration to the wild and scenic river potential as an alternative use of the river.

The HCRC is presently completing the first phase of an inventory of the nation's rivers. The study identifies those rivers with outstanding resource qualities which should be the focus of the HCRC overall river conservation and preservation efforts. Uniqueness of the Hanford Reach and its outstanding fish, wildlife, terrestrial ecology, and recreation values have caused it to be included on the HCRC Nationwide Rivers Inventory List of significant resources. The President recently directed that as part of their normal planning and review process, agencies shall take care to avoid or mitigate adverse effects on rivers identified in the National Inventory. He further directed that agencies shall consult with HCRC prior to taking actions which would foreclose the possibility of future status as wild, scenic, or recreational rivers for rivers identified in the National Inventory. The Corps of Engineers would, therefore, have to consult with HCRC as part of the planning of Ben Franklin Dam.

The Hanford Reach has been preliminarily proposed for listing under Section 5(a) of the Act as authorized for study as a potential addition to the national wild and scenic rivers system.

Law: Endangered Species Act of 1972 as amended (PL 93-205). The purpose of the Act is to provide a means of conserving ecosystems depended upon by endangered and threatened species, and to provide a conservation program for these species. All Federal departments and agencies are

required, through consultation with the Secretary of the Interior or the Secretary of Commerce, to protect resources identified as endangered or threatened by the authority recognized in the Act. These agencies are required to take action "necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined....to be critical."

It is up to the lead agency of a federal project to contact the U.S. Fish and Wildlife Service (FWS) for a list of any endangered or threatened species that may occur in the project area. The complete federal list is published in the Federal Register and updated regularly. Each responsible agency must conduct a biological assessment of the impacts the project would have on any listed endangered or threatened species in the project area. If it is determined that the project would impact a threatened or endangered species, then formal consultation with the FWS is required. The FWS has identified several listed or candidate endangered or threatened species in the Ben Franklin Study area. In planning for the Ben Franklin Dam, the Corps of Engineers would have to conduct the appropriate biological assessments and consult with the FWS as necessary.

Law: Federal Land Management Policy Act of 1976 (PL 94-579, Section 604). This Act directs the Bureau of Land Management (BLM) to investigate if the lands they manage should be considered as potential wilderness areas. If it is determined the land areas should be studied further, BLM would continue the study and determine if the area meets the 64 guidelines listed in the Wilderness Act of 1964 to be included as a national wilderness. The BLM is reviewing the islands in the Hanford Reach for wilderness classification (see Section E).

Executive Order: Protection of Wetlands (EO 11990). This order directs agencies to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands; in particular, in federally-owned lands and for federal projects. Factors relevant to a proposal's effect on the survival and quality of a wetland include maintenance of natural systems including conservation and long-term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources. The only wetlands in the Hanford Reach that were mapped by this study are just below Priest rapids Dam and would not be affected by Ben Franklin Dam; however, there may be small and isolated wetlands on the islands or near the river.

PREHISTORIC/HISTORIC CULTURAL RESOURCES

Note: all of the laws and policies described below require the Corps of Engineers to coordinate with agencies responsible for archaeological/historical preservation, to evaluate existing cultural resources, to assess the impacts of water resource development (e.g., Ben Franklin Dam) on such resources, and to develop measures to mitigate adverse impacts.

Law: National Historic Preservation Act of 1966 (as amended: PL 94-422). The 1966 Act establishes a National program for identifying and preserving sites or artifacts of historical or archaeological significance. The act authorizes the Secretary of the Interior to grant funds for developing comprehensive, statewide surveys and plans for preserving historical properties and to establish a program for providing funds for the purpose of acquiring historical properties. The law also mandates that any federal agency proposing an undertaking shall, prior to any license issuance or approval of expenditures of funds, evaluate the impact of the project on any historically significant artifact. The federal agency is required to permit the Advisory Council on Historic Preservation adequate opportunity to comment on the proposal. For the proposed Ben Franklin Dam, the Corps of Engineers would need to evaluate and consider mitigating measures for the effects on the extensive archaeological resources of the Hanford Reach.

Law: Archaeological Recovery Act of 1960 (16 USC 469-469c). This law requires a survey and other investigation of archaeological areas which may be affected by flooding, access roads, erection of workmen's communities, relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam, if such activities may cause irreparable damage, loss, or destruction of a significant scientific, prehistorical, or archaeological data. Notification in writing by an appropriate historical or archaeological authority, to the Secretary of the Interior, of such action shall warrant further study and investigation of such resources.

Law: Antiquities Act of 1906 (PL 59-209). This Act provides for the protection of all historic and prehistoric ruins or monuments on federal lands. It prohibits any excavation or destruction of such antiquities without permission of the Secretary of the Department having jurisdiction. The Act authorizes the Secretaries of the Interior, Agriculture, and War to give permission for excavation to reputable institutions for increasing knowledge and for permanent preservation in public museums. It also authorizes the President to declare areas of public lands as National Monuments and to reserve lands for that purpose. Much of the study area affected by the Ben Franklin Dam is federal land.

Law: Historic Sites Act of 1935 (PL 74-292). The preservation for public use of historic sites, buildings, and objects was declared as national policy by this Act. It led to the establishment of the Historic Sites Survey, the Historic American Buildings Survey, and the Historic American Engineering Record by giving the Secretary of the Interior authority to make historic surveys, to secure and preserve data on historic sites, and to acquire and preserve archaeological and historic sites. The National Historic Landmarks program and its Advisory Board were also established under this act to designate properties having exceptional value as commemorating or illustrating the history of the United States.

Law: Preservation of Historic and Archaeological Data Act of 1975 (PL 93-291) (also referred to as Reservoir Salvage Act of 1960, as amended). The 1974 Act amends the 1960 law to specify procedures for removing significant historical and archaeological resources from areas affected by Federal construction or Federally licensed or funded projects. The Act provides for funding for surveying and removing of resources considered significant. The federal agency with jurisdiction over a proposed project

that could impact such resources must notify the Secretary of the Interior in writing, providing specific information on the project. The agency may request the Secretary to undertake a program to recover, protect, and preserve these resources, or may undertake the program itself. The federal agency must provide financial assistance to the Secretary for the removal of these resources. For the Ben Franklin Dam, the Corps would comply with these requirements.

Under PL 93-291, Interagency Archaeological Services (IAS), a division of Heritage Conservation and Recreation Service, is responsible for coordinating efforts to protect significant cultural resources threatened by federal projects. The agency operates in accordance with the Archaeological and Historic Preservation Act of 1974, the Archaeological Recovery Act of 1960, Executive Order 11593, Protection of Historic and Cultural Properties, National Historic Preservation Act of 1966, and the Archaeological and Historical Data Recovery Program. Construction of the dam and lock will irreversibly impact archaeological resources known to be in the study area. While the study area has been partially investigated previously, this work does not meet current standards for cultural resource compliance procedures. More complete documentation of cultural resources will be necessary to assess full project impacts. The agency further recommends a complete reconnaissance and assessment of the proposed project area.

Law: The Archaeological Resources Protection Act of 1979 (PL 96-95). The purpose of this act is to secure for the present and future benefit of the American people, the protection of archaeological resources and sites which occur on public lands and Indian lands and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data which were obtained before the date of the enactment of this Act. This act also establishes procedures for permitting the removal of archaeological/historical resources and a penalty system for violations (Federal and Indian lands). The federal agency permitting the removal of artifacts from a cultural or religious site, must, if the removal of these materials harms the site, notify any Indian tribe which may consider the site important.

Executive Order: Protection and Enhancement of the Cultural Environment (EO 11593). The Federal government will lead in preserving, restoring, and maintaining the historic and cultural environment of the Nation. Federal agencies will follow suit, initiate measures, policies, etc., so that Federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored, and maintained for future generations. The Secretary of the Interior is in charge. Responsibilities of Federal agencies and the Secretary of the Interior are addressed.

POWER PRODUCTION AND RELATED ISSUES

Law: Federal Power Act of 1935. The Act is administered by the Federal Energy Regulatory Commission and sets up procedures for licensing of hydroelectric projects. In the Ben Franklin study area, the most pertinent project is the Priest Rapids Dam. For Priest Rapids Dam, the licensing

conditions set minimum flow requirements of 36,000 cfs for nuclear reactor (cooling water) operation on the Hanford Reservation. No specific requirement for sustaining fish populations was set.

If the Ben Franklin Dam were built, the Hanford Reach would become a reservoir and the minimum flow requirements for Priest Rapids Dam for nuclear reactor cooling water would no longer be necessary. However, because of broad concerns about Columbia River fisheries, new flow requirements may be required at Priest Rapids Dam. Overall, the construction of Ben Franklin Dam may affect the minimum flow requirements for Priest Rapids Dam when it is ready for relicensing, but the effects are not known.

Legal Agreement: Federal Energy regulatory Commission; Settlement Agreement (Docket No. 9569), March 1979. This is an order requiring the Public Utility Districts (PUD's) of Grant County, Chelan County, and Douglas County to provide certain minimum flows and to conduct certain studies between 1979 and 1982, and develop techniques that will enhance the area for spawning of the fall chinook salmon below Priest Rapids Dam at Vernita Bar and in the Hanford Reach.

From October 15 to November 30, a minimum flow of 50,000 cubic feet per second (cfs) shall be maintained from Priest Rapids dam downstream. Not more than three weekends during this period shall the flows be reduced to 36,000 cfs for up to 8 hours per day to provide access to Vernita Bar for a ground survey and required studies. Grant County PUD is required to perform certain enhancement studies in connection with river flow requirements for fall Chinook spawning on Vernita Bar in the Hanford Reach of the Columbia River downstream of Priest Rapids Dam. One such study requires the selection of three pairs of plots not more than 5,000 square feet each and not less than 500 yards downstream of Vernita Bar in an area without evidence of prior spawning. The proposed site for these plots is located near the Bonneville Power Administration midway substation in Benton County on the bed and shorelands adjacent to Government Lot 4 in Section 11, Township 13 North, Range 24. The actual time required for this study is uncertain; however, it may extend for a four-year period.

The Ben Franklin Lock and Dam may raise water levels at the proposed study site and may alter the minimum daily flows downstream from the Priest Rapids Dam. During the planning process, the Federal Energy Regulatory Commission (FERC) should be contacted to discuss the potential conflict in use of the Vernita Bar area and possible mitigating measures should be considered.

Legal Agreement: Pacific Northwest Coordination agreement, Amendments, and Operating Procedures. This is basically an agreement between various public power supply systems of the Pacific Northwest to coordinate the operation of their respective systems for the following reasons: to make available to each system its optimum firm load carrying capability; to provide optimum firm load carrying capability for the coordinated system; and to produce the optimum amount of usable secondary energy for each system. The agreement sets out regulations and procedural guidelines to carry out this objective. The agreement includes procedures for reservoir storage and release. The proposed Ben Franklin Dam would have to consider

the procedures outlined in this agreement. There are several supplementary agreements, as follows:

- Amendatory Agreement Number One: Changes involve paragraphs 14(a) and 14(b) of the original document regarding interchange energy imbalances and interchange capacity imbalances.
- Operating Procedures, 1979-1980: This sets out procedures for the yearly operations between energy suppliers in accordance with the Northwest Coordination agreement discussed above.
- Hourly Coordination of Projects on the Mid-Columbia River: The objectives of the operation of the projects are: (a) to obtain increased amounts of electrical power and energy from the total system of projects; (b) to enhance the non-power uses of the river by reducing the extent and rate of fluctuations of river levels insofar as practicable; and (c) to provide flexibility and ease of scheduling generation for the projects by a method of centralized coordinated scheduling and controlling generation of projects with several purchasers through the use of composite scheduling and accounting procedures.

Agency: Bonneville Power Administration (BPA). The BPA operates and maintains high-voltage transmission facilities on the Hanford Reach of the Columbia River.

According to Dan Schausten, Assistant to the BPA Administrator, the Ben Franklin Dam would have to comply with the Pacific Northwest Coordination Agreement, Amendatory Agreement Number One, 1979-1980 Operating Procedures, and Agreement for the Hourly Coordination of Projects on the Mid-Columbia River. If the Ben Franklin Dam authorizing legislation is similar to that of other federal dams in the Pacific Northwest, repayment to the U.S. Treasury of the power-related capital investment and operating costs would be required. These costs are repaid out of BPA revenues, as a fishery and wildlife mitigation costs and irrigation subsidies.

According to Mr. Schausten, BPA has agreements with the Washington Public Power Supply System (WPPSS) and its Project Participants under which BPA acquires the capacity of two nuclear projects now being constructed by WPPSS on the Hanford Reservation. BPA also has certain rights with respect to the generating capability of the WPPSS steam generation facility operated in conjunction with the New Production Reactor. Any construction or operating effects of Ben Franklin Dam which would impact these projects would be of concern to BPA.

According to Mr. Schausten, the development of Ben Franklin Dam and of additional electric energy facilities on the nearby Hanford Reservation would require BPA to build and/or upgrade transmission facilities to integrate the power into the federal grid system. Also, should the coal resources of Montana and Wyoming be developed in part to serve electric loads in the Pacific Northwest, additional east-to-west transmission corridors might be developed, some of which could interdict the Hanford Reach. These land use factors would not necessarily conflict with the Ben Franklin alternative, but deserve consideration as its planning procedures.

2. STATE LAWS, REGULATIONS AND POLICIES

WATER RESOURCES

As part of normal coordination procedures, the Corps of Engineers would coordinate with State agencies which would review the project according to their areas of responsibility as defined by the following State laws.

Law: Review of Water Right Applications (RCW 75.20.050). It is declared to be the policy of the State that a flow of water sufficient to support game fish and food fish populations be maintained at all times in the streams of this State. The Fisheries and Game Departments may review water right applications and request they be denied if stream flow cannot be maintained. The federal agency planning a water resource project should review design specifications to assure that adequate water flows are maintained at all times to support game and food fish even though a permit is not required by law.

Law: Hydraulics Law (RCW 75.20.100). Intended to protect aquatic resources, the Law requires a permit from the Departments of Fisheries and Game for any work performed in the wetted perimeter of a stream or river, providing it is not a federal project. Conditions to meet the Fisheries and Game Department hydraulics criteria would be incorporated into a federal project through the State Water Quality Certification process.

Law: Minimum Water Flows and Levels Act of 1969 (RCW 90.22). The Department of Ecology, when requested by Fisheries or Game, shall establish minimum flows as are necessary to protect fish, wildlife, and water quality.

Law: Water Resources Act of 1971 (RCW 90.54). This Act declares use of water for fish and wildlife maintenance and enhancement. It states that base flows shall be maintained in streams for fish, wildlife, and other uses. Wastes and other pollutant discharges shall receive all known available and reasonable methods of treatment before entering the State's waters. DOE is instructed to develop a State water program and minimum flow requirements.

Policy: River Management Policy Plan, Washington State Department of Natural Resources. This Department has jurisdiction over all State-owned beds and shores of the Columbia River up to and including the area of high water, excluding those lands managed by the U.S. Department of Energy (DOE). This Plan is a general policy statement which reflects the Department's concerns and plans for river management and growth. The Plan does not incorporate the lower Columbia River primarily because of the heavy navigation which occurs there. A federal agency planning a water-related project on State-owned beds and/or shores of the Columbia River should coordinate with the Department of Natural Resources and take into consideration the policies of the Department during the planning and design phase of the project.

Policy: Instream Resource Protection Program for the Main Stem Columbia River in Washington State, Department of Ecology. The Department of Ecology is authorized under Chapter 90.22 and 90.54 RCW to manage the water

resources of the State of Washington. The purpose of the Columbia River Instream Resource Protection Program (CRIRPP) is to establish the State's policies "for insuring the future viability of instream resource values of the main stem of the Columbia River....including fish, wildlife, recreation, aesthetics, navigation, and hydropower resource values" (WAC 173-531-060). The CRIRPP is discussed in more detail in Section E, Ongoing Programs, Studies, and Projects below. Among other results, the program has recommended the establishment of minimum flow requirements in the Hanford Reach; these recommendations are under review by various agencies. A federal agency planning a water-related project should coordinate with the Department of Ecology during the planning and design stage to meet minimum flows once they are established.

NATURAL RESOURCES/FISH AND WILDLIFE

Law: Shorelines Management Act of 1971 (RCW 90.58). This law declares that shorelines are among the most valuable and fragile of the State's natural resources and that they are in danger from development. Unrestricted development on private shorelands is not in the best public interest. The document states there is an urgent demand for a concentrated effort to prevent the inherent harm in an uncoordinated, piecemeal development of the shorelines of the state. Both the Columbia and Snake Rivers were identified as Rivers/Shorelines of Statewide Significance under this law. The Act requires counties and local governments to develop master programs for their shorelines under specific State guidelines. The Act also requires a "Shorelines Permit" for any substantial development. Any federal agency planning a project on either the Columbia or Snake Rivers should coordinate its plans with the local Shoreline Master Programs (in this case the Franklin County Shoreline Master Program) and with the State.

Law: Fisheries Code (RCW 75.20.060). Every dam or other obstruction across or in any stream shall be provided with a durable and efficient fishway. In planning a federal project such as a dam, the federal agency should coordinate with the U.S. Fish and Wildlife Service and with State fish and wildlife resource agencies (Washington State Departments of Fisheries and Game) regarding the design of fishways.

Law: Game Code (RCW 77.12.010). Wild animals and wild birds in the state of Washington are property of the State. The game animals, fur-bearing animals, game and nongame birds, harmless or songbirds, and game fish shall be preserved, protected, and perpetuated. The Washington State Game Department is responsible for the management of the Wahluke Wildlife Recreation Area located along the left bank of the Columbia River at River Mile 373-356. A federal agency planning a project that would impact that area should consult with the Game Department during the project planning process (see also Sections B, C, and E of this report).

Law: Game and Game Fish (RCW 77.16.210). The law states that any person or governmental agency managing, controlling, or owning any dam or other obstruction across any river or stream, shall construct and maintain in good condition and repair in connection with such dam or other obstruction durable fishways and fish protective devices in such shape and size that the free passage of all game fish inhabiting such waters will not be

obstructed. A federal agency planning a dam or obstruction should consult with the Game Department during the planning and design phase to review designs for fishways.

Law: State of Washington House Bill 1447, February 1980. This is basically an updated version of provision sections of RCW which describe the responsibilities of Department of Game. This is not the Game Code but it contains the essence of the department's responsibilities. It states that the Department shall be involved in programs to actively protect and enhance wildlife and wildlife habitats. Sec. 88. Section 77.16.210, Chapter 36 laws of 1955 and RCW 16.210 are amended in this document to read: Persons or government agencies managing, controlling, or owning a dam or other obstruction across a river or stream shall construct, maintain and repair durable fishways and fish protective devices that allow the free passage of game fish around the obstruction. The fishways and fish protective devices shall be provided with sufficient water to insure the free passage of fish. RCW 77.16.220 is also amended to indicate that a water diversion device must be equipped at or near its intake with a fish guard or screen to prevent the passage of game fish into the device and if necessary a means of returning game fish from immediately in front of the fish guard or screen to the waters of origin. Any federal agency proposing a project should coordinate with the Department of Game and take into consideration the Department of Game's policies in the planning and design phases of the project.

CULTURAL/ARCHAEOLOGICAL/HISTORICAL RESOURCES

Law: Archaeological Sites and Resources (RCW 27.53). This law declares archaeological resource preservation a public function. It basically states that the Washington State Office of Archaeology and Historic Preservation is designated the appropriate agency to carry out archaeological studies. It also states that permits are necessary from the Washington State Archaeology Office to alter or dig any archaeological sites. The Washington State Office of Archaeology and Historic Preservation should be contacted to determine any mitigating measures which could be undertaken in conjunction with planning which may impact archaeological resources, as is the case for the proposed Ben Franklin Dam.

POWER PRODUCTION AND RELATED ISSUES

Law: Energy Facilities - Site Locations (RCW 80.50). The growth in energy demands in Washington State necessitates development of a procedure to determine energy sites. Criteria for site selection includes (1) ensuring citizens of stringent operational safeguards, (2) preserving and protecting the quality of the environment, and (3) providing abundant energy at a reasonable cost. The law determines that a commission should be established, made up of head administrators from the Departments of Ecology, Fisheries, Game, Parks and Recreation, and other State agencies to review energy facility siting plans to ensure they meet the three requirements stated above. An agency planning an energy facility should consult with this commission to review the plan and design of such facility. A federal agency would not require certification approval.

E. ONGOING PROGRAMS, STUDIES, AND PROJECTS

The following section is a discussion of existing programs and ongoing studies being conducted by various public and/or private agencies in the Hanford Reach study area.

FEDERAL

Nuclear Waste Disposal. Three different waste disposal programs are now under consideration by the Department of Energy. One is the National Waste Terminal Storage program which is considering deep basalt storage. The second is the Active Storage Program in the 200 Area of the Hanford Reach. The third is the 100 Area of storage of waste produced by the non-plutonium reactors. Wastes in the 100 Area would be inundated by the proposed Ben Franklin Dam and ground water effluent from the 200 waste disposal area might be affected by increasing groundwater elevation caused by the proposed Ben Franklin Dam. Figure 2 in Section C shows the areas affected.

Construction of the Ben Franklin Lock and Dam would affect approximately 65 radioactively contaminated facilities at Hanford. These include all facilities, including all burial grounds and liquid waste disposal sites, in the 100-F Area, all facilities except two burial grounds and a solar still at 100-H, and portions of the reactor effluent systems at 100-D, 100-K, and 100-B. In addition, the caisson storage units at burial ground 318-311 may be affected by elevated groundwater levels (Battelle, The Effects of the Ben Franklin Dam on the Hanford Site, 1979, pp 13, 17, and 103-173).

Wilderness Study. The Federal Land Management Policy Act of 1976 (PL 94-579) requires wilderness studies to be completed by the Bureau of Land Management (BLM) to determine if their lands qualify for classification as wilderness areas under the Wilderness Act of 1964. The BLM administers several islands or portions of islands in the Hanford Reach of the Columbia River. The BLM has recommended that these islands not be designated as wilderness areas. There is a public comment period now in progress. If at the end of the comment period there are no substantial comments or remarks, the decision will become final and will be published in the Federal Register and local newspapers. If the decision were contested and an appeal was made, then the Federal Land Board would review the decision. It would require an Executive Order or Congressional Mandate to designate these islands as wilderness areas. Any planning which may affect islands managed by the BLM should take into consideration the status of these islands.

Unique Ecosystems Program. The name of this program has recently been changed to Important Fish and Wildlife Habitats. It is basically an inventory of unique wildlife value areas. These areas will be placed on a list and published in mid-1980. The U.S. Fish and Wildlife Service then looks at each of the areas and develops methods to protect those areas either by acquisition or through regulatory programs. The Hanford Reach is included in this inventory, however, a plan to protect the area has not yet been

developed. Planning in the Hanford Reach should take into consideration the protection of fish and wildlife habitats identified in this listing.

Saddle Mountain and McNary National Wildlife Refuges (NWR). The FWS manages both refuges for development and improvement of waterfowl and other wildlife habitat. An ongoing program in the Saddle Mountain NWR is the use of irrigation waste waters to create ponds, marshes, and water habitat. This program would not be affected by the proposed Ben Franklin Dam. Filling of the dam reservoir would result in flooding of the McNary NWR islands in the Hanford Reach.

Hanford National Environmental Research Park (NERP). The Park was described in Section B, Land Use. It includes the Arid Lands Ecology Reserve. Ongoing research programs in the NERP are as follows:

- . Restoration of land contours using the principles of water harvest; restoration of productive capacity of arid landscapes by concentrating water.
- . Restoration of shallow waste burial grounds and studies of radio-isotope uptake by plants.
- . Studies of migratory patterns, populations, and preferential locations of Swainson's hawks, mule deer, and Columbia River sturgeon.
- . Measurements of primary productivity.
- . Studies of the impacts of changes in plant species composition on the population of small rodents.

Those programs in the NERP which involve the river or its banks would be affected by the proposed Ben Franklin Dam; these include the studies of mule deer, hawks, and sturgeon. The filling of Ben Franklin reservoir would eliminate deer fawning habitat by flooding existing islands. Fish spawning occurs in certain areas along the entire reach. Sturgeon fishing is particularly noted just above Vernita Bridge; this area will not be much affected by the dam. The Arid Lands Ecology Reserve is far from the river and would not be impacted by the dam.

National Natural Landmarks Program. The program was established in 1963 by the Secretary of the Interior to encourage the preservation of areas that illustrate the ecological and geological character of the United States, to enhance the educational and scientific value of the areas thus preserved, to strengthen cultural appreciation of natural history, and to foster a wider interest and concern in the conservation of the nation's natural heritage. The program was transferred from the National Park Service, which had administered it from its inception, to the Heritage Conservation and Recreation Service (HCRS) when it was created in January 1978.

Areas designated National Natural Landmarks are provided indirect protection by the National Environmental Policy Act of 1969, which requires federal agencies undertaking major actions to file statements which detail the effect of such actions on the environment, including National Natural Landmarks. In addition, an annual report to the Congress is prepared by

HCRS which identifies those National Natural Landmarks which exhibit damage or threats to their integrity.

The process for designation of a National Natural Landmark is as follows (from 36 CFR Part 1212): The Division of Natural Landmarks in HCRS determines areas which should be considered as having potential for designation as National Natural Landmarks. Areas so identified are evaluated by field scientists against criteria contained in 36 CFR 1212.9; these include representative geological and ecological character as a primary criterion and inherent diversity, pristine condition, viability, education/research value, geographic location, and critical habitat as secondary criteria. Areas meeting the criteria are recommended to the Director of HCRS and are reviewed and formally nominated to the Secretary of the Interior through the Assistant Secretary, Fish and Wildlife and Parks, for approval and designation as National Natural Landmarks. Areas approved by the Secretary are listed on the National Registry of Natural Landmarks.

The sand dunes on the right bank of the river from Pm 354 to 358 (Hanford Dunes) have been proposed as a National Natural Landmark by Dr. Rexford Daubenmire in 1975 and by Dr. Frank Scott in 1978. An evaluation has been done for HCRS as required by 36 CFR 1212.4(b). The area proposed is about 6,320 acres. No formal designation has yet been made. The proposed Ben Franklin Dam pool would inundate a small portion of the sand dune shoreline.

Washington Natural Heritage Program. In operation for about two years, this is a data base management program. It is an inventory of aquatic, biologic, geological, and cultural heritage resources. It is funded primarily by the U.S. Heritage Conservation and Recreation Service, Nature Conservancy, and other public and private contributions. All federal, state, and local agencies contribute to this data base. The program has identified at least 16 animal species of concern which have been reported to have significant habitat within the Hanford Reach study area. At least eight special plant species have also been reported to occur within the study area. Any planning in this area should take into consideration the preservation of these species and should confirm their locations in the Hanford Reach.

Water Today and Tomorrow: A Pacific Northwest Regional Program for Water and Related Resources, June 1979. This program was developed by the Pacific Northwest River Basins Commission (PNRBC). The commission was formed in 1967 by Presidential Executive Order 11331. The goal of the program is to maintain or enhance the quality of life in the Pacific Northwest. The functional program involves ten elements and recommended future actions to achieve the goals of each element. The Columbia River is examined in terms of its potential electrical capacity, fish, and wildlife resources and irrigation uses. The program elements for the Columbia River include: revised operation of existing storage, implement all economically and environmentally feasible opportunities for increasing usable water supply, require increased efficiency of existing and future irrigation developments, and establish minimum stream flows for anadromous fish. The suggested future actions to achieve the goals set by this program are; (1) data collection and analysis, (2) planning related research, (3) regional planning, (4) implementation studies and (5) implementation. It is intended that with

this program the region will be able to respond to problems in a unified, organized manner.

As a member of PNRBC, Washington State participated in the initial drafting of the goals and objectives of this program. The Columbia River Instream Resource Protection Program (CRIRPP) is based on those goals set forth in this document (Columbia River Instream Resource Protection Program, Draft, Washington State Department of Ecology, February 1980, p. 2). A portion of the PNRBC program would be implemented through adoption of the CRIRPP by the Washington State Department of Ecology (WDE). The relationship of the Ben Franklin Dam to the PNRBC program and the CRIRPP is noted under State programs below.

Archaeological and Historical Data Recovery Program. The resource programs provided by the Heritage Conservation and Recreation Service (HCRS) establish guidelines and professional standards for effective preservation activities, identify and document cultural resources, offer matching grants for preservation projects, and promote greater interest and involvement in historic preservation by citizens and government. Any federal agency proposing a project must consult with the Advisory Council on Historic Preservation to determine if (1) its undertaking will affect a significant cultural resource in or eligible to be entered in the National Register, and (2) if the resource will be affected, whether the effect will be adverse. The Council must be given an opportunity to comment on the proposed project and explore with the federal agency methods by which the adverse effects can be avoided or minimized. The final mitigation plan must be accepted and incorporated into a legally binding Memorandum of Agreement. If the consultation process reveals no way to mitigate adverse effects, then data recovery (i.e. archaeological excavation) must be undertaken as a final alternative.

STATE

Wahluke Wildlife Recreation Area (WRA) and Ringold Units. The Washington State Department of Game (WDG) has draft guidelines for management of the Hanford Reach and the Wahluke WRA (see also Sections B and C of this report). On an interim basis, the guidelines represent management by protection of existing resources. Interim objectives include:

1. Develop a waterfowl reserve to function as the closed area (of the Hanford Reach) functioned in the past.
2. Protect goose nesting from public disturbance.
3. Protect deer fawning from public disturbance.
4. Maintain eagle and other raptor use at existing levels.
5. Maintain heron rookery use at existing levels.
6. Maintain maximum steelhead spawning potential.
7. Maintain small mouth bass populations.

8. Review ongoing research programs carefully to avoid conflict in these objectives.
9. Allow recreational opportunities that will not interfere with these objectives.
10. Manage for a unique quality recreational experience that fits the isolated nature of the river.
11. Enforce and maintain management programs and objectives.

As discussed in Section C, Land Use Plans, WDG plans for the Ringold Unit of the Wahluke WRA involve cooperative agriculture and farming in Unit 4 and habitat development and improvement in Units 1 and 2.

The proposed Ben Franklin Dam would flood goose/gull nesting and deer fawning areas and spawning grounds. A heron rookery would be destroyed. Portions of Ringold Units 1, 2, and 4 would be inundated.

Draft Columbia River Instream Resource Protection Program (CRIRPP), February 1980. The program is the responsibility of the Washington State Department of Ecology (WDE). The WDE means through this program to establish a set of guidelines to balance the often conflicting interests using Columbia River water, including power, irrigation, navigation, municipal and industrial water supply, recreation, flood control, and fish and wildlife, among others. The program's objective is to ensure that all users "share the burden" during low flow water shortage years. The following is a brief summary of the recommendations included in the draft document. The major elements of the recommended program, as listed on p. 3 of the draft, are:

1. Existing water rights are not affected by this program.
2. Establish minimum average daily flows by administrative regulation. The proposed flows include a provision for reduction during low water years.
3. Establish minimum instantaneous flows by administrative regulation. The proposed minimum flows include a provision for reduction during low water years.
4. Establish a conservation and efficiency provision on future water rights by administrative regulation to insure the sharing of the shortage during low water years.
5. Provide a volume of water for fish and wildlife benefits by negotiation. The use of this volume of water is to be determined by the system operators and the fish and wildlife interests. (The department's regulation does not include specific recommendations related to spill.)
6. For federal projects, seek authorization language to include fish and wildlife purposes.

7. For non-federal projects, intervene in FERC licensing proceedings to seek flow provisions.
8. Encourage intensive management of the system for all uses, specifically including fish and wildlife.
9. Make commitment to consider specific recommendations regarding reservoir fluctuation limits when information becomes available.

Recent revisions (June 1980) to the CRIRPP include, among others:

- . Clarification of the fact that implementation of the program by the State is constrained by federal authority, but that the program is viewed as a means of clearly stating Washington State's policies.
- . Rationalization for the policy that protection for instream resources would be treated as of higher priority than the production of non-firm hydroelectric power.

The construction of Ben Franklin Dam could affect minimum flow requirements in the Hanford Reach below Priest Rapids dam. If the CRIRPP develops regulations controlling reservoir pool fluctuations, planning for operation of the Ben Franklin Dam would have to consider these regulations.

LOCAL/PRIVATE

Fish Spawning and Juvenile Migration studies. On 10 October 1979, the Federal Energy Regulatory Commission issued an order requiring the Public Utility Districts (PUD) of Grant County, Chelan County, and Douglas County to provide certain minimum flows and to conduct certain studies as outlined in the attached Settlement Agreement. Since Priest Rapids Dam directly impacts the spawning area of concern, Grant County has the responsibility to carry out the studies and to develop techniques that will enhance the area for the spawning of the fall chinook salmon. The study program was defined in the Settlement Agreement of 4 March 1980 as follows:

"A five-year study program shall be conducted by the Public Utility Districts to investigate the effect of the projects and their operation on the downstream migration of juvenile salmonids, the methods of improving protection of natural production of salmonids, and the methods of improving and increasing semi-natural and artificial production of salmonids from the Mid-Columbia River."

(The projects are Priest Rapids, Wanapum, Rock Island, Rocky Reach, and Wells Dams.) The Vernita Bar Spawning Survey dated December 1979 was prepared for Grant County PUD before the Settlement Agreement; it describes a survey of fall chinook salmon spawning in the Vernita Bar area below Priest Rapids Dam between October 1978 and June 1979. Future studies under the five-year study program will be spawning flow studies at Vernita Bar and spring spill - juvenile downstream migration studies. The studies will be

completed before the construction of the Ben Franklin Dam. Any results or recommendations from these studies may, however, be affected by the construction and operation of the dam.

Washington Public Power Supply System (WPPSS) Projects. The WPPSS has a lease agreement for lands on the Hanford Reservation north of Richland and is constructing three steam-electric (nuclear) plants there (Figure 2). The leased lands extend to the right river bank where water intake facilities are located. The Ben Franklin dam would flood some of the leased lands and the existing water intake facilities. It could necessitate redesign and reconstruction of the entire intake system.

Puget Sound Power and Light Nuclear Plant Siting Study. The utility is presently drilling to test soils at three sites north of the WPPSS construction site. No site has been selected and there is no report of investigations to date. Effects of the Ben Franklin dam would depend on the nuclear site chosen by the utility.

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BIBLIOGRAPHY

Battelle, Pacific Northwest Laboratories. Aquatic and Riparian Resource Study of the Hanford Reach, Columbia River, Washington; Draft. U.S. Corps of Engineers, 1980, 75 pp. plus appendix.

The purpose of this study was to identify the existing aquatic and riparian habitats and associated fishery resources between Priest Rapids Dam and the City of Richland. The study quantifies the production and value of fall chinook salmon in the reach and the probable effects of the Ben Franklin Dam alternative on these resources as well as threatened plant communities and species. It presents a good, thorough inventory of shoreline vegetation, island vegetation, upland vegetation, and wetlands classification of the Hanford Reach and the probable impacts of the Ben Franklin Dam on these resources. The study concludes that inundation of spawning and rearing habitat for up-river fall chinook salmon would result in the elimination of the natural production of this species. There would be a drastic reduction in returns of fall chinook salmon to the Priest Rapids Spawning Channel and losses of habitats or reduction in habitat quality important for mountain whitefish, white sturgeon, small-mouth bass, and channel catfish. However, the dam alternative would result in expansion of habitat area suitable for production of small centrarchids bulkheads, large-mouth bass, walleye northern squawfish and carp. Also included is a summary of impacts to vegetation.

. The Effects of the Ben Franklin Dam on the Hanford Site. U.S. Department of Energy; Richland, Washington, 1979, 219 pp.

This report presents a preliminary analysis of the effects of the dam and recommendations that a number of studies be accomplished to fully evaluate and understand these potential impacts. The seven studies discussed in this report are: groundwater-hydrology analysis, soil liquefaction analysis, hydrostatic uplift and soil effects on structures, assessment of the potential for landsliding and sloughing, facility decommissioning, hydrothermal analysis, and meteorological effects. For each of the elements, the effects of the proposed Ben Franklin Dam were evaluated and described in some detail. Four other aspects commented upon in this report were aquatic ecology, terrestrial ecology, socioeconomic effects, and public interaction. To the extent possible, cost estimates were developed for corrective actions which must be taken on the Hanford site to accommodate the dam.

. The Hanford Nuclear Energy Center: A Conceptual Study. Department of Energy, Richland, WA; September 30, 1978, 179 pp.

The study identifies the potential technical and environmental problems associated with the development of a Nuclear Energy Center (NEC) at Hanford Reservation, and suggests possible solutions. The study assumed an HNEC consisting of 20 nuclear power plants to be completed by the year 2006. Topics covered in the report include: engineering

choices (e.g., site selection, heat sink management, electrical transmission, and reliability of generation); environmental matters (e.g., terrestrial and radiological effects); socioeconomic factors (e.g., community impacts); and licensing considerations.

The report provides a conceptual layout of the NEC and useful information on the relationship between Columbia River water (and changes in the availability of water such as the proposed dam might cause) and NEC plans for heat sink management. The most significant points raised followed:

- . Maximum number of reactors with once-through cooling depends on future decisions affecting the minimum river flow; present flow (36,000 cfs) would sustain six reactors for a 20-reactor HNEC and a flow of 54,000 cfs would sustain ten reactors.
- . The Hanford Reach stretch of the Columbia River responds more rapidly to changes in weather and thermal modification from industrial effluents as compared to impounded parts of the river. Water supply, rather than weather, is the principal determinant of variations in river temperature--significant in changing the capacity of the river as a heat sink if out-of-stream uses of river water (i.e., irrigation) increase. Overall, a regional long-range water use plan for this area needs to be developed before the river is considered a dependable source of thermal power plant cooling, and before development of HNEC can proceed.

_____. Potential Thermal Effects of an Expanding Power Industry: Columbia River Basin. April 1972.

This document mentions the Columbia Treaty, between the U.S. and Canada. The U.S. obtained additional protection from periodic flooding with Canadian reservoir space. U.S. and Canada agreed to share in downstream benefits.

Benton County Planning Department. Benton County Shoreline Master Plan. 44 pp.

The County does not classify shoreline affected by the dam because it is all within the Hanford Reservation.

_____. Preliminary Draft Comprehensive Plan: Benton County, Washington. March 1980.

Contains no specific policies for the Hanford Reach because it is all in the Hanford Reservation.

Bonneville Power Administration. Columbia Basin Project, Return Flow Study, 1970 and 2020 Levels of Development. 1973, 36 pp. plus appendices.

This report sets forth the assumptions and calculations used to develop irrigation demands, return flows and depletion amounts for the Columbia Basin Project for a 1970 and 2020 level of development. This information is necessary for the development of modified flows at hydroelectric projects on the mainstem Columbia and lower Snake Rivers and for irrigation studies in general. The report determines the acreage irrigated and calculates the return flow of both groundwater and surface water runoff to determine the availability of water for developments (irrigated) up till the year 2020. It contains a map which shows the Columbia Basin Project's existing facilities with available water, current development areas and lands under investigation for potential development. The Columbia River is included on this map. This is merely a report, not a regulatory document. However, the return flow requirements would affect the operation of Ben Franklin Dam.

Chelan, Douglas, Grant County PUD's and Corps of Engineers, North Pacific Division, Seattle District. Stewards of the River. No date, 36 pp, (published about 1973-1974).

The report summarizes land and water use along portions of the Columbia River, including the Hanford Reach; it includes maps with wildlife, fish, archaeological, scenic, and recreational uses located along the Hanford Reach. The report recommends that the uses of and access to the reach be controlled and the river be maintained in its free flowing state.

Columbia River Water Management Group. Columbia River Water Management Report. January 1979.

Management Program for the John Day-McNary Reach of the Columbia (Adopted August 1978). Major element: reservation of 1,360,000 acre-feet of water annually for irrigated agriculture and 26,000 acre-feet per year for municipal supply to the year 2020.

"Family Farm Act" (November 1977). DOE limits future water rights for irrigation to single ownerships of no more than 2,000 acres. Term permits are granted to develop larger areas, provided they are subsequently divided into single farm units of no more than 2,000 acres.

Pacific Northwest River Basins Commission's Regional Program (DOE). Developing a prioritized list of state and federal water-related projects and activities in the Columbia Basin states.

USGS Cooperative Program. DOE and USGS involved together in statewide water resources and water quality projects.

Franklin County Planning Department and Citizens Advisory Committee. Shorelines, Franklin County. June 1975, 123 pp.

This plan is for all the shorelines of Franklin County. The shorelines of the Hanford Reach of the Columbia River are designated either Conservancy or Rural. The County has no legal jurisdiction over the reservation to implement these designations on the reservation.

Henager, C.H., Pacific Northwest Laborator. Enclosure No. 1 and Deju, R.A., Basalt Waste Isolation Project, Rockwell International, Enclosure No. 2 in a letter to Colonel Leon K. Moraski, Corps of Engineers, from Alex Fremling, Department of Energy, Richland. May 27, 1980.

Short reports dealing with possible soil liquefaction problems below potential reactor sites in a Hanford Nuclear Energy Center, effects on siting of commercial reactors at Hanford, and possible hydraulic or seismic problems in siting an underground waste repository as a result of Ben Franklin Dam.

Horner, Ned, and T.C. Bjornn. Status of Upper Columbia River Fall Chinook Salmon (Excluding Snake River Populations). University of Idaho, Moscow, Idaho, February 1979. 45 pp.

This document discusses factors affecting salmon population and abundance. Factors include dams, exploitation, inadequacy of existing regulatory mechanisms and other man-made factors. The document then discusses existing conservation measures and future conditions. The document briefly discusses the Endangered Species Act of 1973 and the future of salmon if it were placed on the endangered species list.

Lower Columbia Audubon Society, Richland Rod and Gun Club, Mid-Columbia Archaeological Society, Inter-Mountain Alpine Club, and N.W. Chaper, Sierra Club. Ben Franklin Reservoir Tour Guide. Seattle District Corps of Engineers, December 1968, 8 pages.

This is a tour guide used by the Army Corps on a boat trip down the Hanford Reach of the Columbia River. It describes the archaeological, cultural, natural resources, and physical characteristics of the stretch of the river from Priest Rapids Dam to Richland.

Pacific Northwest River Basins Commission. Water Today and Tomorrow: A Pacific Northwest Regional Program for Water and Related Resources. Vol. I, II, and III, June 1979.

Volume I is a summary which describes the scope and purpose of the program. Volume II, The Region, is a detailed report for the regional action program which examines existing conditions and future needs of the region in terms of water resources. It outlines a program for future studies and actions to be taken by either joint interstate agencies, independent agencies, or a new institutional arrangement. Volume III, The States, is a supporting document for Volumes I and II, and has a state orientation documenting the status of water resource issues and programs in the PNRBC area of each of the five states.

Pacific Northwest River Basins Commission, Power Planning Commission.
Review of Power Planning in the Pacific Northwest: Calendar Year 1978.
April 1979, 104 pages.

The study provides general background on energy legislation and energy production and demand. The data could be used to describe the potential contribution of Ben Franklin Dam to reducing future supply/demand deficits.

The study outlines significant activities occurring in 1978 relative to energy production in the Pacific Northwest, including regulatory as well as facility planning and development. The study also describes future power demands, existing facilities providing power, and future resources available for meeting these demands. In addition, the study summarizes technological research and development which could affect the future energy situation.

Pacific Search Magazine. The Columbia's Final Stretch, June 1979.

This article describes the U.S. Fish and Wildlife Service "Unique Ecosystem" study and the renewed study of the Ben Franklin Dam alternative by the Army Corps of Engineers due to the lobbying of the Pacific Northwest Waterways Association last year. It discusses the value and beauty of the river and the opinions of various agencies about the project.

Parametrix, Inc. Vernita Bar Spawning Survey. Grant County PUD, December 1979. 48 pp.

This report describes a survey of chinook salmon spawning at the Vernita Bar area of the Columbia River. The bar is located downstream from Priest Rapids Dam. Alterations in the amount of water discharge from Priest Rapids Dam and subsequent fluctuations in water levels have a potential for causing detrimental effects on salmon spawning and the survival of eggs at Vernita Bar. The Washington State Department of Fisheries conducted similar spawning surveys in 1977. This study uses the information from similar surveys conducted back to 1960 and draws conclusions as to the changes of spawning in the bar area, in relation to natural conditions as well as to the effects of Priest Rapids Dam.

Peterson, Larry D. Hydropower Aspects of the Hanford Reach. Paper presented at U.S. Army Corps of Engineers Public Workshop on the Hanford Reach Study, January 29, 1980, 6 pp.

This is a presentation by Larry D. Peterson at the public workshop. The paper talks about alternative energy sources available and how each is being used, developed, or explored, including: conservation, coal, nuclear, solar, and hydro power. He makes a strong case for hydro, mentioning the recommendations made by the President in 1979 to use hydro power fully when suitable sites are identified.

Shapiro and Associates, Inc./Parametrix, Inc. Aquatic and Wildlife Resources of the Hanford Reach of the Columbia River with Particular Emphasis upon the Impact of Water Resource Development. U.S. Army Corps of Engineers, March 1979.

The report summarizes available information, provides an annotated bibliography on the fish and wildlife resources of the Hanford Reach, and the potential impacts of water resource development.

U.S. Army Corps of Engineers. Analysis of Environmental Problems. Virginia, August 1970. 25 pp.

This is a position paper written regarding the first look by the Corps at the Ben Franklin Dam in the 60's and why the decision was made not to continue with it at that time. The document includes discussions of potential problems that other agencies see with the dam alternative.

_____. Senate Document No. 91-112, 91st Congress, 2nd Session, Columbia River and Tributaries, Washington, 1970.

This is the Upper Columbia River Navigation Study report. Included in the report is a summarization of concerns of various departments which are primarily related to fish spawning and wildlife habitat loss.

_____, North Pacific Division. Reach Inventory, Columbia River Headwater McNary Reservoir to Grand Coulee Dam. Portland, Oregon, June 1977; approximately 65 pages plus photo mosaics.

The Columbia River and Tributary Study (CR&T) was being undertaken at the time this document was published. The CR&T Study intended to investigate present and future water resources, problems, and opportunities for the Columbia River. This book is an inventory of existing land uses and conditions of the river from McNary Reservoir to Grand Coulee Dam. This inventory was part of the CR&T program. The CR&T Study will aid in determining future operational guidelines for existing Columbia River system projects.

_____, Seattle District. Ben Franklin Lock, Dam and Reservoir: Columbia River, Washington, Volume I. Seattle, July, 1969. 84 pp. plus appendices.

The purpose of the report is to evaluate the feasibility for constructing a multipurpose dam at River Mile (RM) 348 on the Columbia River. Parameters considered include hydro-electric power needs, river transportation, water-oriented recreation, and the impact of the dam and reservoir upon fish and wildlife and other environmental resources. The study does not discuss the project's relationship to other plans and programs for the Hanford Reach, but does provide data which will help in assessing the dam's impact on plans and policies.

_____, Seattle District. Ben Franklin Lock, Dam, and Reservoir, Volume 2. July 1969.

This document contains the appendices of Volume 1, Main Report. Appendix A is Project Details, Appendix B and D contain reports from Battelle Northwest, and Appendix C contains a report from Douglas United Nuclear, Inc. Appendix E, a report of the Federal Bureau of Outdoor Recreation, discusses the recreational needs of the area and the recreational development plan on the reservoir. It concluded that based on demand studies the plan would result in general recreation values. The report attempts to compare the fish and wildlife losses to the recreational gains. Appendix F is a report from the Department of Interior Fish and Wildlife Service. It discusses the existing fish and wildlife conditions and projected conditions if the dam were built. It makes a strong recommendation that the project not be authorized and if it is authorized, that funds be appropriated to the U.S. Fish and Wildlife Service and Department of Game for studies to mitigate adverse effects to fish and wildlife.

_____, Seattle District. Hanford Reach. January 1980.

A brochure for citizens to be involved in the Hanford Reach Study. No plans or policies are mentioned.

_____, Seattle District. Hanford Reach Tour Guide. October 1979, 25 pages plus notes.

This report summarizes the existing land uses and general physical conditions of the Hanford Reach of the Columbia River. It also has a detailed description of the physical features which occur on each River Mile (RM) of the river (Note: There are some conflicts between this document and the Reach Inventory discussed above).

U.S. Department of the Interior. Natural Resources Tour, Hanford Reach, April 24, 1979.

This is a tour guide which documents the sights of the river from Priest Rapids Dam to North Richland as seen from a boat. The document contains information on the natural and cultural resources of the reach and a statement that:

"...the Hanford Reach is a unique area, rich in fish, wildlife, archaeological, historic, and scenic resources and because it is the very last area of its kind, is certainly worthy of special consideration for preservation for future generations to enjoy..."

_____, Bureau of Land Management. Wilderness Review Intensive Inventory. March 1980, 429 pp. plus maps.

This report and maps describe the most recent decisions in the Bureau of Land Management's intensive wilderness inventory in Oregon and Washington. The report is divided into two parts: (1) describes BLM's final decisions on the intensive inventory of 30 inventory units in southeast Oregon; (2) describes the proposed decisions on all other BLM lands. Page 422, Unit Number 13-67 discusses the Columbia River Islands, their physical characteristics, wilderness features, values, and recommends that they be eliminated from further wilderness review.

U.S. Energy Research and Development Administration. Final EIS, Waste Management Operations, Hanford Reservation. Springfield, Virginia, 1975. Volume 1 of 2 volumes.

The purpose of this statement is to reassess the environmental impact associated with continuation of the Hanford Waste Management Operations Program. It provides an informational record for use in future planning and decision-making in order to assure that further waste management practices will be conducted so as to minimize adverse environmental consequences. The statement reassesses an existing program. Included in the Foreword is an introductory summary of the current policies, plans, and standards applicable to the Hanford Waste Management Operations Program. The standards referred to are basic standards for protection of the health and safety of the public contained in Energy Research and Development Administration Manual (ERDAM), Chapters 0510, 0511, 0513, and 0524. The existing land uses of the Hanford area is detailed in Sections II.3-1 through II.3-7. The document concludes in "The Relationship of the Proposed Action to Land Use Plans, Policies, and Controls," Section VII-1, that the continued operation of the Hanford waste management facilities will not conflict with Federal, state, or local plans and programs. It mentions the Ben Franklin Dam alternative as a proposed project whose plans are not complete and therefore it is not included in the analysis of this report.

_____. Final EIS, Waste Management Operations, Hanford Reservation, Appendices. Springfield, Virginia, 1975. Volume 2 of 2 Volumes.

This document contains the appendices of the information contained in the Final EIS. It is the technical supplement to the studies and results discussed in Volume 1 of the Final EIS.

U.S. Federal Energy Regulatory Commission. Settlement Agreement. March 1979.

This is an order requiring the PUD's of Grant County, Chelan County, and Douglas County to provide certain minimum flows and to conduct certain studies between 1979 and 1982, and develop techniques that will enhance the area for spawning of the fall chinook salmon below Priest Rapids Dam at Vernita Bar and in the Hanford Reach.

Washington State Department of Ecology (WDE). Columbia River Instream Resource Protection Program. Olympia, Washington, February 1980. 200 pp.

The WDE attempts, through this study, to establish a set of guidelines to balance the often conflicting interests using Columbia River water, including power, irrigation, navigation, municipal and industrial water supply, recreation flood control, and fish and wildlife, among others. Its objective is to assure that all users "share the burden" during low flow water shortage years. The report provides background information on water use (hydro-electric power generation, irrigation, etc.) on the Columbia and instream resource production under present trends. It makes recommendations for minimum average daily flows, minimum instantaneous flows, conservation and efficiency provisions, reservation fluctuation limits, and management for fish and wildlife benefits. The EIS accompanying the WDE study discusses general impacts of the construction of Ben Franklin Dam but makes no recommendations.

Washington State Department of Game. The Undammed Columbia: A Brief Biological Overview of the Hanford Reach of the Columbia River Relative to Recent Public Access. U.S. Fish and Wildlife Service, June 1978. 21 pp. plus bibliography.

The purpose and scope of this report is to summarize briefly the past and present state of fish and wildlife resources dependent upon the river and associated habitat. Consideration is given to the importance of the area as a biological study preserve and the potential impacts of public access on wildlife, fish and research projects. Mitigating measures are suggested to lessen the environmental impacts of public access and use of fish and wildlife resources. The report concludes that the impacts of human influx would be negative to both fish and wildlife but there would be an overall benefit to the public of a large new recreation area that may provide thousands of use-days of activity. The author concludes by recommending that regulations be adopted to allow public use of the area on a high quality level and to preserve all the existing fish and wildlife populations at their optimum level with natural production. He then suggests three specific implementing regulations that might be considered.

. Guidelines for Management of the Hanford Reach of the Columbia River. June 1978, 11 pp.

The document is a draft of land and water use management guidelines for the Hanford Reach portion of the Wahluke Wildlife Recreation Area (WRA); it has been the basis for existing management. It includes general management goals and objectives for the Wahluke WRA and specific objectives for protection of the Columbia River resources.

Washington State Department of Transportation. Scope of Work on Legislative Study on a Proposed Toll Bridge over the Columbia River at North Richland. Washington, February 1980.

This is a scope of work on a study currently being undertaken. The study will consider the social, economic, engineering and environmental factors and determine the feasibility of constructing a bridge at River Mile (RM) 343, downstream from the proposed location of the Ben Franklin Dam. Design criteria for the bridge include 56 feet vertical clearance and 400 feet channel clearance. The proposed bridge does not conflict with the Ben Franklin Dam.

Appendix A

LIST OF AGENCIES CONTACTED

Appendix A

LIST OF AGENCIES CONTACTED

The following is a list of all agencies contacted by telephone, interviewed in person, and/or responding to a survey questionnaire. About 120 survey questionnaires were sent to agencies and groups; of these, 28 were returned. Agencies contacted are listed alphabetically under federal, state, and local agencies, and interest groups.

Federal

Advisory Council on Historic Preservation - Louis S. Wall
Army Corps of Engineers, Walla Walla District - Ray Oligher, Lee Turner
Bonneville Power Administration - Dan Schausten
Bureau of Indian Affairs
Bureau of Land Management - Jim Fisher
Bureau of Reclamation - Mr. Woodworth
Department of Agriculture - David Ingersoll
Department of Energy - Ben Melton
Environmental Protection Agency - Dan Petke
Federal Energy Regulatory Commission - Gregory H. Bowers
Fish and Wildlife Service - Jay Gore, Marge Kolar, John Dobel, Ron Starkey, Dave Geoke, Bob Burkholder
Geological Survey - Mr. Pistrang, Don White
Heritage Conservation and Recreation Service - Richard L. Winters, Kelly Cash, Gordon Atkins
Interagency Archaeological - Garland Gordon
National Oceanic and Atmospheric Administration, National Marine Fisheries Services - Thomas E. Kruse, Dale Evans
Pacific Northwest River Basins Commission - Bill Hutchinson
Soils Conservation Service - Richard Reeley
Wenatchee National Forest - Robert G. Lewis

State

Department of Ecology - Jim Bucknell
Department of Fisheries - Lloyd Phinney
Department of Game - Leslie Lynam, Tony Eldred, Gale Blomstrom
Department of Natural Resources - Ron Holtcamp
Department of Transportation - Joseph Bell
Natural Heritage Program - Annette Olsen
Office of Archaeology and Historic Preservation - Christina Bedegrew
Washington Public Power Supply System - R.A. Chitwood

Local

Benton County Planning Department - Terry Marden
Benton County PUD No. 1 - R.W. Blodgett
Benton-Franklin Council of Governments - Dave Mattoon, Glen Miles
Chelan County PUD No. 1 - Jim Huffman
City of Kennewick - William C. Kennedy

City of West Richland - Jo Felch
Douglas County PUD No. 1 - John A. Gregg
Franklin County Planning Department - Robert Booth
Pasco Planning Department - Gary Crutchfield
Port of Benton - Douglas Edison, Mr. Micklyon
Port of Chelan County - Richard C. Harris
Port of Kennewick - Sue Watkins
Richland Planning Department - Bill Davis
South Columbia Irrigation District - Russ Smith

Interest Groups

Columbia River Citizens Compact - Nancy Thomas
Columbia River Conservation League - J.L. Brimhall
Oregon Wheat Growers League - Wesley Grilley
Richland Rod and Gun Club - Dave Myers
Tri-State Steelheaders - Ray Weis
Washington Environmental Council - Steve Metcalf

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